APPENDIX A

RECLAMATION PLAN

North Elko Pipeline Project
Draft Reclamation Plan

Please refer to Figure A-1 contained at the end of this Appendix.

Introduction

Vegetation types within the proposed North Elko Pipeline Project (NEPP) right-of-way (ROW) vary according to soil types, topography, climatic conditions, and land management practices. Several seed mixes would be necessary to accommodate the range of variability in soils, elevation, terrain, and annual precipitation. This would include seeding of native and adapted species representative of the existing variability in ecological sites primarily though a rangeland drill application and broadcast seed application where terrain is limiting. In addition, planting of container-grown shrubs would be considered within documented pygmy rabbit habitat based on the 2011 and forthcoming 2012 field surveys, and vegetative propagules (e.g. "plant root plugs" or tree stem cuttings) would be recommended to reestablish plants in riparian areas subject to temporary disturbance as a result of construction of the NEPP.

Re-establishing vegetation in semi-arid habitat can be challenging because of unpredictable precipitation and potential for spread of weed species. Proper seedbed preparation, mulch, adapted seed mix species, and weed control and abatement are all ways to improve the chances of successful plant establishment.

Reclamation Goals

Reclamation goals for pipeline disturbances are 1) stabilize the site, and 2) establish a productive plant community based on the applicable land use plan. To meet these goals, a Reclaimed Desired Plant Community (RDPC) is selected for use on the disturbed areas. A RDPC is defined as a perennial plant community established on a disturbed site which contributes to stability through management and land treatment, and which produces that type and amount of vegetation necessary to meet or exceed the land use for the site.

Species Selection, Seed Source and Proposed Seed Mixes

The seed mixes contained herein were initially developed for Ruby Pipeline ROW reclamation efforts by BLM Elko, Winnemucca and Susanville districts personnel; Nevada Department of Wildlife (NDOW) personnel and individual landowners. Analysis of primary ecological sites along the NEPP ROW also indicates that seed mixes used for the Ruby Pipeline ROW would be application for reclamation within the NEPP Project Area.

Seeding would be the main method of reestablishing vegetation within the Project Area including staging areas. Installation of container plants would be used to re-establish important shrubs such as Wyoming, mountain or basin big sagebrush, antelope bitterbrush, and Utah serviceberry in specific critical habitat areas agreed upon by NEPP and the BLM.

Seeds for the seeding mixes would be purchased from commercial vendors or collected by professional seed collectors following BLM seed collection policy and tested in accordance with AOSA (Association of Official Seed Analysts) seed testing procedures. Seeds would be tested for purity and viability, and certified as weed free to ensure compliance with local, state, and federal seed requirements. Seed sources

would be from the immediate vicinity of the NEPP Project Area or within similar ecological sites. Commercially available seed would be purchased to provide the remaining seed requirements and would be from ecological sites similar to the Project Area. BLM would be informed of commercially available seed sources and any major species substitutions recommended would be communicated to BLM, NDOW and individual landowners. All seed mixes would be require approval by BLM and NDOW, or private landowners on their respective lands.

The NEPP would be constructed primarily on Wyoming big sagebrush, basin big sagebrush, big sagebrush-bitterbrush, low sagebrush, and montane shrub vegetation types. To a lesser degree, the NEPP would cross areas of riparian habitat. Native and adapted species seed mixes would be used to rehabilitate existing and proposed temporary disturbance on public and private lands to the extent possible and according to BLM field office policy for the public lands. The seed mix for private lands could be based on previous or adjacent land uses and would be approved by the landowner.

The proposed seed mixes were designed to be compatible with the dominant ecological sites, vegetation types and land uses currently found within the Project Area. The criteria used for selecting the seed mixes considered the following:

- Erosion-control capability
- Plant dominance of surrounding vegetation
- Land use
- Availability of seed
- Wildlife habitat value, and
- Livestock management.

Tables A through D present the seed mixes (pounds and seed numbers are rounded) provided by the BLM Tuscarora Field Office for use on public lands. Private landowners could also select the same seed mixtures. Figure A-1 lays out the mile post references for application of each seed mix for the proposed NEPP. Seed mix application by incremental mile posts would be referenced on the pipeline construction design plans for reclamation.

Table A represents the big sagebrush – bitterbrush vegetation type which generally extends from the Willow Creek Meter Station near Ruby Pipeline MLV-24 to approximately Antelope Creek. This seed mix represents the following ecological sites: Loamy 8-10" P.Z. (025XY019NV) - upper elevation area with bitterbrush component, Loamy 10-12" P.Z. (025XY014NV), Loamy 12-16 PZ (025XY012NV), and South Slope 12-14 P.Z. (025XY009NV) ecological sites. Other ecological sites in the area exist as associated sites.

Table A. RDPC Big Sagebrush - Bitterbrush Seed Mix.

Species (Variety[1)]	Rate Pure Live Seed (lbs/ac)	# PLS Seeds/sq.ft.
Drill Seeding Seed Mix -		
Snake River wheatgrass (Secar)	1.5	5
thickspike wheatgrass (Bannock)	1.5	5
bluebunch wheatgrass (P-7)	2.0	6

Great Basin wildrye (Magnar)	1.0	3
Canby bluegrass (Canbar)	0.25	5
big bluegrass (Sherman)	0.25	5
arrowleaf balsamroot[2]	2.0	2
Sainfoin (Eski[2])	2.0	1
blue flax (Appar[2])	0.75	6
Antelope Bitterbrush [2,3,5]	3.0	1
Broadcast Seeding[4]		
Western yarrow (Idaho cultivar)	0.15	10
mountain big sagebrush	0.05	3
basin big sagebrush	0.05	3
Wyoming big sagebrush[4,5]	0.05	3
Rounded Total	**15**	**56**

Table B. represents the low sagebrush vegetation type which generally occurs from south side of China Camp Ridge just north of Antelope Creek and for approximately about 0.5-mile south of Antelope Creek and then in the vicinity of Squaw Creek south to Bell Creek. This seed mix represents the following ecological sites: Primarily Claypan 12-16" P.Z. (025XY017NV), Claypan 10-12" P.Z. (025XY018NV) and Cobbly Claypan 8-12" P.Z. (025XY022NV).

Table B. RDPC Low Sagebrush Area

Species (Variety[1)])	**Rate Pure Live Seed (lbs/ac)**	**# PLS Seeds/sq.ft.**
Drill Seeding Seed Mix -		
bluebunch wheatgrass (P-7)	2.5	8
Great Basin wildrye (Magnar)	1.0	3
Sandberg's bluegrass (Idaho cultivar[2)])	0.4	8
bottlebrush squirreltail[5]	1.0	4
Idaho fescue (Joseph)	1.0	10
antelope bitterbrush[2,3,5]	2.0	0.6
arrowleaf balsamroot[2]	2.0	2
blue flax (Appar)	0.25	2

Broadcast Seeding[4]-		
Western Yarrow[4,5]	0.15	10
gray low sagebrush/ early low sagebrush[4,5]	0.15	9
basin big sagebrush[4]	0.15	9
Rounded Total	**11**	**66**

Table C. represents a fuel break seed mix to be applied in the Boulder Valley area from Bell Creek south to the Goldstrike Meter Station. This low precipitation mix would have de facto fuel break attributes in regard to drought-tolerant species that would stay succulent for a longer period of time during the "fire season". This seed mix is applicable to the following ecological site: Loamy 8-10" P.Z. (025XY019NV).

Table C. Low Precipitation Wyoming big sagebrush Fuel Break

Species/Variety[1]	**Rate Pure Live Seed (lbs/ac)**	**# PLS Seeds/sq.ft.**
Drill Seeding Seed Mix -		
Siberian wheatgrass (Vavilov)	3.0	12
Russian wildrye (Boizoisky[2)]	2.0	8
Sandberg bluegrass	0.5	11
thickspike wheatgrass (Bannock)	1.5	5
Blue flax (Appar)	0.50	3
Gooseberry-leaf globemallow	0.50	6
Four-wing saltbush	1.5	
Aerial/Ground Broadcast Seeding[3]		
Western yarrow[4,5] (Idaho cultivar)	0.15	10
forage kochia[4] (Immigrant)	0.75	7
Rounded Total	**10**	**62**

Table D. Riparian Habitat Broadcast Seed Mix

Species/Variety[1]	**Rate Pure Live Seed (lbs/ac)**	**# PLS Seeds/sq.ft.**
creeping wildrye	20.00	23
streambank wheatgrass (Sodar)	14.00	50

Western yarrow	0.15	10
Rounded Total	**34**	**83**

[1] Species could be substituted due to availability or future knowledge regarding better cultivars or similar species for the site(s). Utah serviceberry seed would be considered for inclusion in the seed mix on any sites where it existed prior to pipeline construction.
[2] Recommend seeding by itself in separate drill rows through partitions in the drill to increase potential for establishment.
[3] Bitterbrush seed requires acid-washing and scarification or outer shell removed before seeding.
[4] Aerial/Ground broadcast-seeded over the drill seeding area after drill-seeding operations.
[5] Local collection

Seedbed Preparation

Seedbed preparation would consist of trench backfill with surface soils backfilled last, de-compacting. The final grade surface soils would be worked with heavy equipment to create a roughened surface. The roughened soil surface would facilitate the collection of precipitation to enhance soil water percolation, reduce erosion, provide safe sites for seedling establishment and initially discourage livestock use. The seedbed would be firm but not compacted, nor will it have a crusted surface. Thus, application of seed would need to occur within a reasonable time from completion of seedbed preparation.

Seeding Methods

The U.S.D.A. - Natural Resources Conservation Service recommendation for drill-seeding rate on arid and semi-arid rangelands with large seeded species is 20-40 pure live seeds (PLS) per square foot, and for small seeded species (most seed mixes), the rate is 30 to 50 PLS per square foot. Broadcast or aerial seedings are at the rate of 60 to 95 PLSs per square foot (approximately double the drill-seeding rate).

The main purpose of seeding methods is to place the seed in direct contact with the soil, cover the seed with soil, and firm the soil around the seed to eliminate air pockets. Most species can be successfully drill seeded into the soil. Seeding depth in the soil depends on seed size and species specific requirements. In general, grass and forb seed would be planted at a soil depth greater than 0.5 and 0.25 inch, respectively. Sagebrush, forage kochia and Western yarrow seed is best broadcast seeded on the soil surface which enhances probability of germination and establishment.

Direct seeding would be the primary method for seeding within the ROW. Direct seeding uses specialized equipment such as a rangeland seeder. The advantages of direct seeding are efficiency at placing seed at the proper soil depth and economy of bulk seed. Its disadvantages are terrain limitations such as slopes greater than 15 percent and rocky soils. Broadcast seeding distributes the seed on top of the soil surface using a hand-held or all-terrain vehicle-mounted cyclone-type seed spreader, seed blower, and/or aerial application. The all-terrain vehicle would drag a medium gauge chain behind to cover seed as it is applied. Broadcast seed is not as efficient as direct seeding because in this method, burial of all seed in the soil is not guaranteed by "dragging". Thus, it is assumed that some seed will be lost due to becoming airborne or as a result of rodent and bird foraging. Due to these reasons it is recommended that the seeding rate be twice that of the bulk seed rate for a broadcast seed application. In areas where broadcast seeding occurs, a drag or harrow would be used to cover the seed, where possible. The broadcast application of forage kochia, Western yarrow and Wyoming big sagebrush would be applied over the Drill Seeding Seed Mix without any additional harrowing.

Fertilizer, Soil Amendments, and Weed Control

NEPP does not anticipate the need for application of fertilizers or soil amendments as part of its post-construction reclamation activities because elevated levels of soil nitrogen may encourage weedy plant colonization.

PPC would conduct a field survey by a qualified botanist prior to initiation of ground disturbing activities to determine the location, extent and population characteristics for noxious weed species in the Project Area. Area. Based on those survey results, in cooperation with the BLM Noxious Weed Specialist, PPC would implement the Noxious Weed Management Plan (Appendix C).

Container Plant Installation

Shrubs such as low sagebrush and Wyoming sagebrush would be grown in containers and transplanted, during late fall or early winter, into approximately 1.5 acres of land near MLV#24, that would be disturbed by the NEPP project, that is currently in or adjacent to an existing pygmy rabbit colony. The location is where the proposed NEPP leaves the Ruby Pipeline right-of-way. The shrubs would be planted into a small basin, approximately 24 inches in diameter and 4 inches deep, to concentrate precipitation and surface runoff near the plant roots.

Local seed ecotypes for these species might not be commercially available, and production is unpredictable. In this case, local ecotype seed would be collected within the same ecological site as the NEPP Project Area, or from other similar ecological sites, and grown in containers at nurseries such as the NRCS Fallon Plant Materials Center, Winnemucca Middle School, Washoe State Nursery, Lucky Peak Nursery in Boise, Idaho or consideration of private vendors that worked on the Ruby Pipeline Project. Planting density would be similar to adjacent undisturbed plant communities. Shrubs would be planted to replicate patterns of the surrounding area, to the greatest extent possible.

Site-specific sagebrush species seedlings would be required in areas documented by PPC qualified ecologist as occupied by pygmy rabbits. Density of seedlings would equal 800 seedlings per acre in a uniform pattern.

Measurement of Reclamation Success

Prior to the first growing season post reclamation, PPC's qualified ecologist would prepare a proposed monitoring protocol to address quantitative monitoring for revegetation success for review and approval by the BLM.

Project Area Stabilization – First through Third growing Seasons

At the peak of the first through third growing seasons, (subject to annual local plant phenology) following reclamation implementation, PPC would contract with a qualified ecologist to document the status of stabilization for all treatment areas. This would be conducted through on-site ocular review of the project area and photographic, written and GPS documentation of "problem areas' and potential causes. Site stability would be assessed qualitatively where the NEPP Project Area would be considered stable for areas that do not have new or expanded noxious weed infestations, if no large rills or gullies, observable soil movement, slope instability, subsidence, slumping, or other signs of erosion that are inconsistent with adjacent area. Site stability would be considered successful in areas where there are no new or expanded noxious weed colonies and the following "accelerated erosion indicators" are not exceeded or the Project Area land surface is observably similar to adjacent, undisturbed land over the first growing season post reclamation:

- Soil movement: the depth of recent deposits around rock fragments and other obstacles or on

micro-terrace is ½ inch deep

- Surface litter movement: 25% surface litter has been trans-located and re-deposited against obstacles down slope.
- Pedestaling: pedestals are ½ inch and/or frequency of 10 or more/100 sq ft.
- Flow pattern development: 25% of area shows evidence of recent movement of soil and litter.
- Rills: 3inch deep and at 10 foot intervals.
- Gullies: 200 foot and intervals and observable unstable.
- Channel erosion and gulley development: 25% of channel bed and walls show active erosion or bank failure progressing along channel walls; observable sediment occurring along 25 percent of the channel bottom.
- Plant root systems: no disturbance is observable (uprooting)
- Wind scoured depressions –depth of ½ inch over 25% of area.

The status of stabilization for all treatment area would be documented in a report and submitted to the BLM for review and concurrence by August 1 of that growing season. If areas of accelerated erosion or new or expanded noxious weed infestation are documented, the report shall provide recommended remediation measures. Recommended remediation measures will be reviewed by the BLM and the BLM and PPC would work together to determine appropriate remediation measures to be implemented during the fall/winter of that growing season year.

Site stability monitoring would be conducted starting at the height of the first growing season post reclamation and revegetation and would be conducted annually for a period of 3 years (3 growing seasons) or until the site is documented as being stable according to the criteria. Monitoring would be conducted through onsite observation and documented by mile post mileage for the areas exceeding the site stability criteria. Areas exceeding criteria would be considered unsuccessful in meeting the criteria and remedial actions would be necessary.

Documentation of site stability would be submitted annually to the BLM for review and approval. Upon notification of areas that exceed the site stability criteria, the BLM and PPC will collaborate to develop appropriate remedial measures to stabilize the sites without causing new disturbance.

Second through Fifth Growing Seasons:
During the second through fifth growing seasons following reclamation implementation, a qualified ecologist would be responsible for documenting site stabilization and for measuring the success of revegetation establishment within all treatment areas. In addition, within the treatment areas the presence of noxious weeds prior, new or expanded would also be documented.

Revegetation success would be based on plant establishment, not only planting or seeding and would be considered successful if: 1) sites are stable; 2) seeded species and desirable volunteers are becoming established; and 3) there is evidence of plant reproduction (seed production/new recruitment). The minimum criteria for success are as follows.

Reclaimed Desired Plant Community (RDPC) Criteria Minimums[1]

	Min.% cover (basal &	Min. % cover (canopy)	Min. Plants per square	Min. Plant life forms types	Min. Diversity	Max. annuals % allowed	Min. Aggregate Stability Class

	crown)		**meter**	**required**			
big sage-bitterbrush (Table A)	20	25	7	3	6	10	>3
low sagebrush (Table B)	20	25	7	3	6	5	>3
low precipitation Wyoming big sagebrush (Table C).	15	20	5	2	4	15	>2

[1] Mature perennial plants fifth-year criteria

During the first growing season, PPC's qualified ecologist will prepare proposed monitoring protocol to address quantitative monitoring for revegetation success for review and approval by the BLM.

The status of project area stabilization and revegetation success for all treatment area would be documented in a report and submitted to the BLM for review and concurrence by August 1 of that growing season. If areas of accelerated erosion or new or expanded noxious weed infestation are documented, the report shall provide recommended remediation measures. Recommended remediation measures will be reviewed by the BLM and the BLM and PPC would work together to determine appropriate remediation measures to be implemented during the fall of that growing season year.

Riparian Habitat – Perennial - At Surface Flow

In the spring of 2012, PPC would contract with a qualified ecologist to visit each proposed drainage feature crossing and assess pre-construction channel characteristics (rating of Proper Functioning Condition, total air dry production) and riparian plant community species. This assessment would be used by PPC to provide site specific design and proposed reclamation techniques for each proposed crossing.

In the interim, the BLM has proposed the following criteria for revegetation success. It is understood by PPC and the BLM that the reclamation success criteria would be subject to revision based on the spring 2012 field assessment results.

Short-term - by June 2016 (or three growing seasons after revegetation):

- 50% or greater progress towards, and

Long-term - by June 2018 (or five growing seasons after revegetation) achieve the following:

- Allow for a minimum or an equivalent of at least 1,700 pounds/acre of total air dry production for seeded plants and native plantings consistent with plants listed under the ecological site description* by allowable percentages.
- Allow for rating of Proper Functioning Condition (PFC) upward trend by 2016 and PFC by 2018.

*Wet Meadow Ecological Site 025XY005NV. "Location of typical example of this site" is in the vicinity of the NEPP Proposed Action north of Wells, Nevada and is referenced in NRCS – Major Land Resource Area 25 binder.

Riparian Habitat – Ephemeral - No Surface Flow for a majority of the growing season

Short-term - by June 2016 (or three growing seasons after revegetation):

- 50% or greater progress towards, and

Long-term - by June 2018 (or five growing seasons after revegetation) achieve the following:

- Allow for a minimum or an equivalent of at least 1,300 pounds/acre of total air dry production for seeded plants and native plantings consistent with plants listed under the ecological site description* by allowable percentages.
- Allow for rating of Proper Functioning Condition (PFC) upward trend by 2016 and PFC by 2018.

*Dry Meadow Ecological Site 025XY006NV. "Location of typical example of this site" in the vicinity of pipeline route north of Well, Nevada and is referenced in NRCS – Major Land Resource Area 25 binder.

Potential Remediation Measures

Because initial reclamation and seeding efforts may not be successful, re-seeding may be necessary on specific areas that fail to meet site stability and/or revegetation success criteria.

Based on annual monitoring results NEPP would re-seed areas where initial plant establishment efforts fail. The BLM or landowner would be consulted regarding any proposed changes in seeding mixes and application methods. If successful plant establishment is not achieved within 10 years appropriate compensatory mitigation would be discussed with BLM. Additional monitoring would occur as necessary and agreed upon by PPC, BLM and the landowner as appropriate.

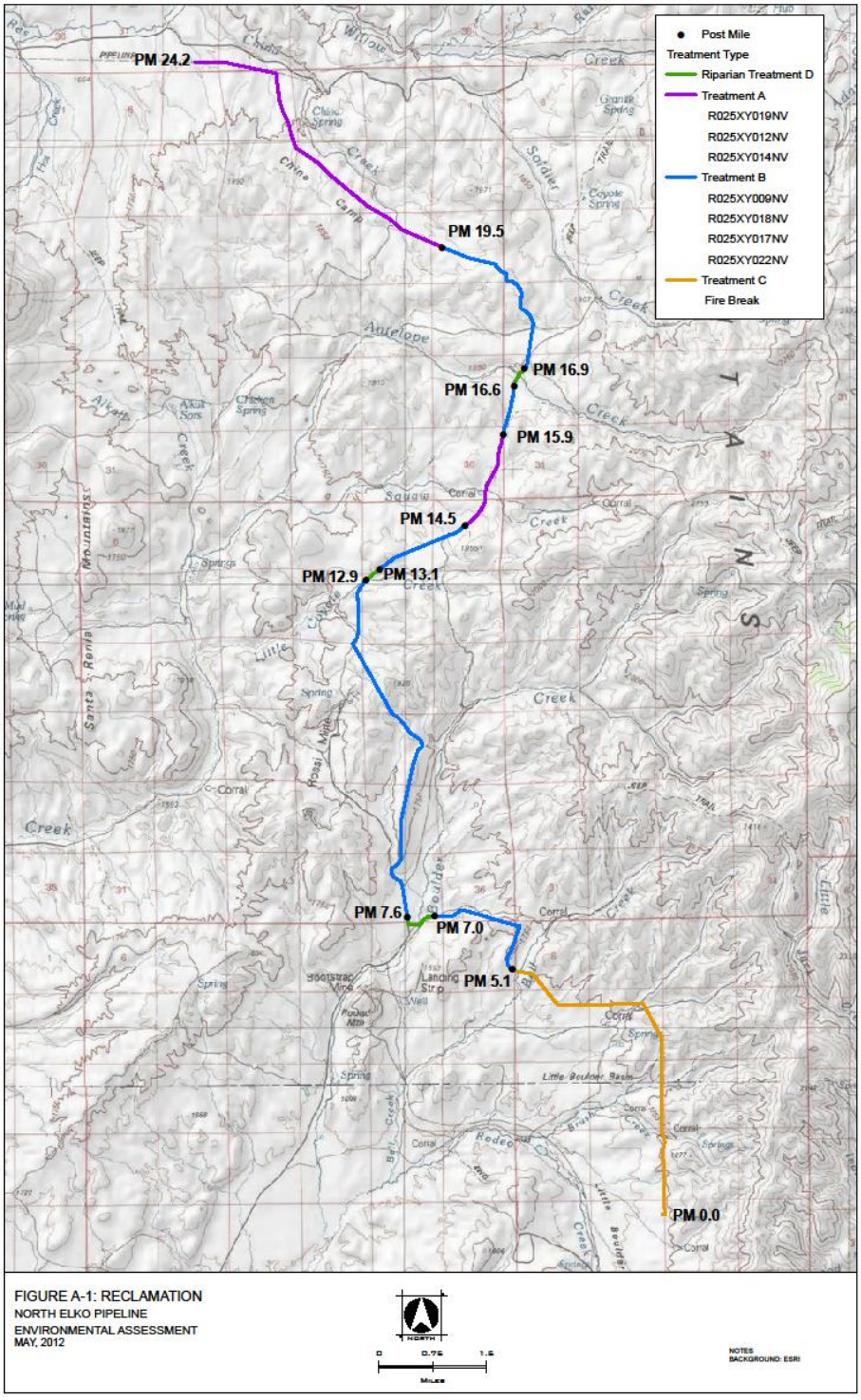

Figure A-1. Reclamation Map